UNIVERSITI TEKNOLOGI MARA

OPTIMISATION OF EXTRACTION, CLARIFICATION AND PASTEURISATION OF CLARIFIED GUAVA [*PSIDIUM GUAJAVA L., cv KAMPUCHEA (GU8)*] JUICE DRINK

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Thesis submitted in fulfillment of the requirements for the degree of Master of Sciences

Faculty of Applied Sciences

August 2006

ABSTRACT

A diet of guava juice drink not only improves our health but also promotes growth and vigour to our body. Extractions of juice through the use of enzymes are more effective and cheaper because a small quantity of enzymes will help to extract a large amount of juice. Centrifugation of juice is a process to separate pulp from the juice in order to produce clarified juice. Pasteurisation is important to inhibit the pectinesterase enzyme which will stabilise the cloudiness of juice and at the same time kill to non-pathogenic microorganisms.

Studies were conducted to determine the effect of different maturity stages of guava skin colour, pulp content, calcium, ascorbic acid, absorbance on the yield of extraction. Guava fruit at 90% maturation were selected for the preparation of clarified guava juice drink due to their high level of calcium content, absorbance value or cloud content and guava juice yield.

A pH (X_1; 3.2 - 4.0), concentration of enzyme Pectinex Ultra SPL (X_2; 500 - 900 ppm), temperature (X_3; 30 - 50°C) and reaction time (X_4; 0 - 120 min) were the four parameters manipulated to produce a high yield extraction of guava (Kampuchea cv *Vietnamese*) juice drink, which was carried out using a Response Surface Methodology (RSM). It was found that optimum yield extraction of the guava juice was obtained at the following optimum condition: pH of 3.2, enzyme concentration of 500 ppm, temperature at 50°C and reaction time of 120 minutes.

Relative centrifugal field (RCF) (X_5; 600 - 1000 x g) and centrifugation time (X_6; 30 - 70 minutes) were the two parameters adopted to produce clarified guava juice drink, which was carried out using a RSM. Optimum clarification of the guava juice drink was

Candidate's Declaration

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In the event that my thesis be found to violate the conditions mentioned above. I voluntarily waive the right for conferment of my degree and agree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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CHAPTER 1

INTRODUCTION

The beverage industries in Malaysia can be divided into two categories which are, non-alcoholic beverages and alcoholic beverages. According to Federation of Malaysian Manufacturers, (2002) there has been an increase at about 57% in the export of non-alcoholic beverages from 1995 to 2000. This indicates a growing demand for them. One of the potential beverages in non-alcoholic beverages is tropical fruit juices.

The United States import market for tropical fruit juices, concentrates, and pulp and puree were valued at an estimated $125 million in 1995. The increasing health awareness among consumers, and product innovation and aggressive marketing by processors and retailers should reinforce this trend. Pineapple juice and concentrate are by far the most popular items among the tropical juices which were imported into the United States, followed by banana and guava (Rudy, 1997).

Nowadays, quite a number of Malaysian companies are producing tropical fruit juices such as pineapple juice by Eo Ha Manufacturing Cooperation Sdn. Bhd., Meetco (Malaysia) Sdn. Bhd., Polyno Resources Sdn. Bhd. and Rida Fruits Sdn. Bhd. Pink guava juice is produced by Ria Fruits Sdn. Bhd. and guava juice is produced by M and S Food Industries.

A new technology had been introduced in the beverages industry resulting in the production of clarified tropical fruit juices. For example, research on clarified guava